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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/729,177	12/04/2003	Vijayakrishna Prasad Guduru	P17116	8583

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CAVEN & AGHEVLI  
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P.O. BOX 52050  
MINNEAPOLIS, MN 55402

EXAMINER
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SINGH, RAMNANDAN P

ART UNIT	PAPER NUMBER
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2614

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/17/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/729,177	<b>Applicant(s)</b> GUDURU ET AL.	
	<b>Examiner</b> Ramnandan Singh	<b>Art Unit</b> 2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 04 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date, _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>March 15, 2004</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Claim 12 recites "the **adaptive filter** comprises a **background filter**, a **foreground filter**, and a **second coefficient memory**". How these three components are connected together to constitute a single adaptive filter is not shown. Fig. 3 shows disjoint connections of these three components of the adaptive filter. These features are not shown. A similar thing holds for claim 22. Therefore, these features must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be

renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

2. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

3. The abstract of the disclosure is objected to because the abstract does not contain a verb describing the technical disclosure of the patent. Correction is required. See MPEP § 608.01(b).

### ***Claim Objections***

4. Claim 1 is objected to because of the following informalities:

Claim 1 recites the limitation "coefficient filtering in response based on" in line 7. The term "in response based" is in error.

Appropriate correction is required.

### **5. Preliminary Amendment**

The Preliminary amendment filed on Dec. 07, 2006 is approved.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C.

112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the near end signal energy **not being sufficient**" in line 12. The term "not being sufficient" in claim 1 is a relative term which renders the claim indefinite. The term "sufficient" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

A similar thing holds for claim 2 also. Claims 3-10 being dependent from claim 1 are also rejected.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 11-19, 21-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Demirekler et al [US 6,980,646 B1].

Regarding claim 11, Demirekler et al teach an apparatus shown in Fig. 2; comprising:

an adaptive filter to selectively (i.e. sparsely) process a selected portion of a near end signal based on selected portions of the far and near end signals [Fig. 2A; col. 2, lines 55-67; col. 4, lines 1-43; col. 1, line 49 to col. 2, line 27];

a fixed filter to selectively (i.e. sparsely) process the selected portion of the near end signal based on selected portions of the far and near end signals [Fig. 2B; col. 4, lines 44-67];

a controller (i.e. Signal Analysis Logic) to control processing of the selected portion of the near end signal [Fig. 2C; col. 5, lines 15-26];

a coefficient memory (i.e. circular buffer) to store coefficients used by the fixed filter and the adaptive filter [Figs. 2, 2A; col. 3, line 56 to col. 4, line 8; col. 4, lines 44-52; col. 6, lines 1-2]; and

a comfort noise generator (i.e. CNG) to selectively replace the selected portion of the near end signal with comfort noise [Fig. 2D; col. 5, line 46 to col. 7, line 10].

Claim 21 is essentially similar to claim 11 except for a speaker and a microphone. The speaker and the microphone are not shown by Demirekler et al.



Regarding claim 12, Demirekler et al further teach the apparatus,  
wherein the adaptive filter comprises:

a background filter to selectively apply adaptive coefficient filtering of  
the selected portion of the near end signal [col. 4, lines 1-8; col. 5, lines 1-  
14];

a foreground filter to selectively apply fixed coefficient filtering of the  
selected portion of the near end signal and to provide the fixed  
coefficient filtered selected portion of the near end signal from the adaptive  
filter [col. 4, lines 44-67]; and

a second coefficient memory (i.e. second indexed buffer) created by  
the circular buffer logic to store coefficients used by the background filter  
and to selectively provide the coefficients for storage into the coefficient  
memory [col. 3, line 56 to col. 4, line 8; col. 4, lines 44-52].

Claim 22 is essentially similar to claim 12 and is rejected for the reasons stated above.

Regarding claims 13 and 15, the limitations are shown above in claim 1.

Regarding claim 14, Demirekler et al further teach the apparatus, wherein the background filter utilizes a recursive normalized least mean square algorithm to update coefficients based on processing of the near end signal [Fig. 1A; col. 3, lines 1-16; col. 4, lines 1-8].

Regarding claim 16, Demirekler et al further teach the apparatus, wherein the fixed filter comprises a fixed coefficient finite impulse response (FIR) filter [col. 4, lines 44-52].

Regarding claims 17 and 18, Demirekler et al further teach the apparatus, wherein the comfort noise generator is to selectively replace the selected portion of the near end signal with comfort noise based in part on energy in the selected portion of the near end signal after the transferring

or prior applied processing [Fig. 2; col. 5, lines 46-55; col. 5, line 64 to col. 6, line 12].

Regarding claim 19, Demirekler et al further teach the apparatus, wherein the portion comprises multiple samples (i.e. multiple reflections) [col. 2, lines 63-67].

### ***Claim Rejections - 35 USC § 103***

10. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Demirekler et al as applied to claim 11 above.

Regarding claim 20, although Demirekler et al do not teach expressly processing every other subframe of the selected portion of the near end signal, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made to select a set of implementation details including processing every other subframe of the selected portion of the near end signal of the sparse echo canceller in order to reduce a

computational load of the echo canceller in case of a slow varying system without sacrificing any computational precision requirement.

***Allowable Subject Matter***

10. Claims 1-10 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

The following is a statement of reasons for the indication of allowable subject matter:

Claim 1 recites a method and limitations for the following: "selectively transferring the selected portion of the near end signal without processing using foreground adaptive coefficient filtering and without processing using fixed coefficient filtering in response to a ratio of the selected portion of the far end energy signal over the selected portion of the near end signal energy not being sufficient". The prior art of record does not teach this

limitation in the context of the claim. Therefore, claim 1 is indicated allowable.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(i) Iyengar [US 5,663,955] teaches an echo canceller system with shared coefficient memory [Whole document]; and

(ii) Diethorn [US 20030053617 A1] teaches an echo canceller comprising a background filter and a foreground filter [Figs. 1-2; Para: 0021-0028].

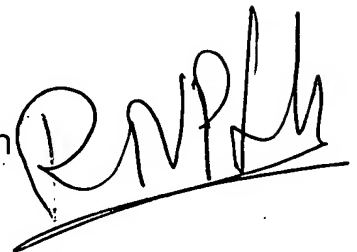
12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ramnandan Singh whose telephone number is (571) 272-7529. The examiner can normally be reached on M-TH (8:00-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fan Tsang can be reached on 571-272-7547. The

fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ramnandan Singh  
Examiner  
Art Unit 2614

A handwritten signature in black ink, appearing to read 'RNS', with a long horizontal stroke underneath.